

# INTERNATIONAL SEARCH REPORT

Inter Application No  
PCT/US2004/037394

A. CLASSIFICATION OF SUBJECT MATTER  
IPC 7 A61K39/09 C12N9/24 A61P11/02 C07K16/12

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
IPC 7 A61K C12N C07K

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, Sequence Search

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category * | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|------------|---|-----------------------|
| X          | CAMARA M ET AL: "A NEURAMINIDASE FROM STREPTOCOCCUS PNEUMONIAE HAS THE FEATURES OF A SURFACE PROTEIN" INFECTION AND IMMUNITY, AMERICAN SOCIETY OF MICROBIOLOGY, WASHINGTON, DC, US, vol. 62, no. 9, September 1994 (1994-09), pages 3688-3695, XP001118871<br>ISSN: 0019-9567 | 1-17                  |
| Y          | figure 2<br><br>-& DATABASE EMBL 'Online!<br>15 December 1998 (1998-12-15),<br>XP002326581<br>retrieved from EBI<br>Database accession no. P62575<br>abstract<br><br>-----<br>-/--  | 18-26,<br>46-52       |

☒ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

### \* Special categories of cited documents:

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
- \*E\* earlier document but published on or after the international filing date
- \*L\* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- \*O\* document referring to an oral disclosure, use, exhibition or other means
- \*P\* document published prior to the international filing date but later than the priority date claimed

- \*T\* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
- \*X\* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
- \*Y\* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

23 May 2005

Date of mailing of the international search report

07. 10. 2005

Name and mailing address of the ISA  
European Patent Office, P.B. 5818 Patentlaan 2  
NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,  
Fax: (+31-70) 340-3016

Authorized officer

Page, M

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| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT |  |                        |
|--|--|------------------------|
| Category *   | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No.  |
| X  | HOSKINS J ET AL: "Genome of the Bacterium Streptococcus pneumoniae Strain R6"<br>JOURNAL OF BACTERIOLOGY, WASHINGTON, DC, US,<br>vol. 183, no. 19, October 2001 (2001-10),<br>pages 5709-5717, XP002231307<br>ISSN: 0021-9193  | 1-17                   |
| Y  | Discussion closing paragraph; table 1<br><br>-& DATABASE EMBL 'Online!<br>15 December 1998 (1998-12-15),<br>XP002326747<br>retrieved from EBI<br>Database accession no. P62576<br>abstract   | 18-26,<br>46-52        |
| X  | DATABASE EMBL 'Online!<br>29 November 2002 (2002-11-29),<br>XP002326748<br>retrieved from EBI<br>Database accession no. AX570279<br>abstract<br>-& WO 02/077021 A (CHIRON SPA; THE<br>INSTITUTE FOR GENOMIC RESEARCH; MASIGNANI,<br>VEGA; TETTE) 3 October 2002 (2002-10-03)   | 1-26                   |
| Y  | SEQ ID NO. 3488 99% identical to SEQ ID<br>NO. 15 and 16 over 800 amino acids.<br>page 2, line 22 - line 25; claim 22  | 46-52                  |
| X  | WO 02/083855 A (AMERICAN CYANAMID COMPANY;<br>ZAGURSKY, ROBERT, JOHN; MASI, AMY,<br>WADHAMS;) 24 October 2002 (2002-10-24)<br>SEQ ID NO. 363 99% identical to SEQ ID NO.<br>15 and 16 over 800 amino acids.<br>page 2, line 28 - line 32<br>page 13, line 3 - line 30<br>example 2; tables 17,18   | 1-26,<br>46-52         |
| P, X   | WO 2004/092209 A (INTERCELL AG; MEINKE,<br>ANDREAS; NAGY, ESZTER; HANNER, MARKUS;<br>DEWASTHAL) 28 October 2004 (2004-10-28)<br>page 1, paragraph 2 - page 2, paragraph 1<br>page 37, paragraphs 6,7<br>SEQ ID NO. 213 is 98% identical to SEQ ID<br>NO. 15 and 97% identical to SEQ ID NO. 16<br>over 946 amino acids.<br>page 12, paragraph 2<br>page 38, paragraphs 3,4 | 1-23, 25,<br>46-49, 51 |

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| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT |   |                       |
|--|---|-----------------------|
| Category *   | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
| A  | BRILES D E ET AL: "MOUSE IMMUNO GLOBULIN G-3 ANTIBODIES ARE HIGHLY PROTECTIVE AGAINST INFECTION WITH STREPTOCOCCUS-PNEUMONIAE" NATURE (LONDON), vol. 294, no. 5836, 1981, pages 88-90, XP001206261<br>ISSN: 0028-0836<br>page 89, left-hand column, paragraph 2; tables 1,2   |                       |
| Y  | MARTINOT A ET AL: "HEMOLYTIC-UREMIC SYNDROME ASSOCIATED WITH STREPTOCOCCUS-PNEUMONIAE MENINGITIS" EUROPEAN JOURNAL OF PEDIATRICS, vol. 148, no. 7, 1989, pages 648-649, XP009047126<br>ISSN: 0340-6199<br>Introduction  | 26,52                 |
| Y  | WO 00/06737 A (MICROBIAL TECHNIQS LIMITED; GILBERT, CHRISTOPHE, FRANCOIS, GUY; HANSBR) 10 February 2000 (2000-02-10)<br>page 1, line 19 - line 24<br>page 3, line 10 - page 5, line 28<br>page 13, line 9 - line 22<br>claims 6,9-12  | 18-26,<br>46-52       |
| A  | BERRY ANNE M ET AL: "Cloning and characterization of nanB, a second Streptococcus pneumoniae neuraminidase gene, and purification of the nanB enzyme from recombinant Escherichia coli" JOURNAL OF BACTERIOLOGY, vol. 178, no. 16, 1996, pages 4854-4860, XP002326580<br>ISSN: 0021-9193<br>the whole document                | 1-26,<br>46-52        |
| P,X  | DATABASE EMBL 'Online!<br>14 May 2004 (2004-05-14),<br>XP002326749<br>retrieved from EBI<br>Database accession no. AAT15796<br>abstract<br>& US 6 699 703 B1 (DOUCETTE-STAMM LYNN ET AL) 2 March 2004 (2004-03-02)<br>SEQ ID NO. 3166 91% identical to SEQ ID NO. 15 and 98% identical to SEQ ID NO. 16 over 937 amino acids. | 1-26                  |

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Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of Item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the International application and necessary to the claimed invention, the International search was carried out on the basis of:
  - a. type of material
    - ☒ a sequence listing
    - ☐ table(s) related to the sequence listing
  - b. format of material
    - ☒ in written format
    - ☐ in computer readable form
  - c. time of filing/furnishing
    - ☒ contained in the International application as filed
    - ☒ filed together with the international application in computer readable form
    - ☐ furnished subsequently to this Authority for the purpose of search
2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.
3. Additional comments:

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### Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:  

Although claims 20-37, 46-52, 61-67, 76-82, 91-97, 106-112 and 122-125 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this International application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☒ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:  

1-26, 46-52

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.  
☐ No protest accompanied the payment of additional search fees.

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-26,46-52

A detoxified pneumococcal neuraminidase or an antigenic portion thereof, composition comprising the same and method of treatment using the same.

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2. claims: 27-32,38-45

Method of treatment using pneumococcal neuraminidase or an antigenic fragment thereof, a composition comprising the same and containers comprising said composition.

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3. claims: 33-37

Method of treatment using pneumococcal neuraminidase antibody or a fragment thereof.

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4. claims: 53-67

A composition comprising a phosphocholine or an antigenic portion thereof of pneumococcal teichoic acid or lipoteichoic acid, containers comprising said composition and method of treatment using the same.

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5. claims: 68-82

A composition comprising pneumococcal neuraminidase or an antigenic portion thereof and a phosphocholine or an antigenic portion thereof of pneumococcal teichoic acid or lipoteichoic acid, containers comprising said composition and method of treatment comprising the same.

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6. claims: 83-97

A composition comprising a non-phosphocholine antigenic portion of pneumococcal teichoic acid or lipoteichoic acid, containers comprising said composition and method of treatment using the same.

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7. claims: 98-112

A composition comprising pneumococcal neuraminidase or an antigenic portion thereof and a non-phosphocholine antigenic portion of pneumococcal teichoic acid or lipoteichoic acid, containers comprising said composition and method of treatment using the same.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

8. claims: 113-125

A composition comprising a phosphocholine antibody or a fragment thereof, containers comprising said composition and method of treatment using the same.

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| Patent document<br>cited in search report |    | Publication<br>date | Patent family<br>member(s)  | Publication<br>date  |
|---|----|---------------------|---|--|
| WO 02077021                               | A  | 03-10-2002          | CA 2439431 A1<br>EP 1373513 A2<br>WO 02077021 A2<br>JP 2005503119 T<br>US 2005020813 A1 | 03-10-2002<br>02-01-2004<br>03-10-2002<br>03-02-2005<br>27-01-2005 |
| WO 02083855                               | A  | 24-10-2002          | CA 2444133 A1<br>JP 2005501518 T<br>MX PA03009415 A<br>WO 02083855 A2                   | 24-10-2002<br>20-01-2005<br>29-01-2004<br>24-10-2002               |
| WO 2004092209                             | A  | 28-10-2004          | WO 2004092209 A2  | 28-10-2004   |
| WO 0006737                                | A  | 10-02-2000          | CN 1367833 A<br>EP 1100921 A2<br>WO 0006737 A2<br>JP 2002531055 T<br>US 2003091577 A1   | 04-09-2002<br>23-05-2001<br>10-02-2000<br>24-09-2002<br>15-05-2003 |
| US 6699703                                | B1 | 02-03-2004          | US 6800744 B1<br>US 2005136404 A1   | 05-10-2004<br>23-06-2005   |